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NMR RELAXATION AND THE STATE OF SOLVENT MOLECULES IN SOLUTIONS OF POLYVINYLCHLORIDE AND POLYSTYRENE IN DIBUTYLPHTHALATE*

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An analysis was made of temperature concentration dependences of spin-spin relaxation time and the coefficient of self-diffusion of dibutylphthalate molecules in solutions containing 0-20 vol. % PVC and PS. It was established that, in contrast with the PS solution, PVC solutions contain a small proportion of dibutylphthalate molecules, which are more inhibited, compared with the remaining mass of solvent, and are exchanged with the latter.

PREVIOUSLY, when studying translational mobility in PVC and PS solutions it was shown that the addition of macromolecules reduces absolute values of the coefficient of self-diffusion D of dibutylphthalate (DBP) without changing its temperature dependence [1]. The NMR pulse method was used in this study to investigate special features of nuclear relaxation and the state of DBP molecules in PVC and PS solutions

Spin-spin relaxation times T_2 were measured using a laboratory spectrometer with a frequency of proton resonance of 16.5 MHz, in the temperature interval of 250-330°K. Solutions with a polymer content of 0-20 vol. % were examined. Characteristics of initial substances, methods of preparing the samples and experiments were described previously [1, 2]. All samples were previously degassed under vacuum.

Figure 1 shows temperature dependences of T_2 for pure DBP (curve 1) and DBP molecules in solutions containing ~15% PS (curve 2) and PVC (curve 3). It can be seen that the addition of PS macromolecules, reducing absolute values of time T_2 of DBP does not practically change the type of temperature dependence (at least when $T > 275$ K), i.e. the same regularity is observed as for the

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